Systems Stability and Reliability

Contract #: 500-97-011 **Project #:** 6
Contractor: San Diego Gas and Electric Company
Project Amount: $100,000
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Status: Completed

Project Description:
This project investigated the feasibility and benefits of implementing Flexible AC Transmission System (FACTS) devices on Extra High Voltage (EHV) electricity transmission lines to increase power transfer capability and electricity import capability. The use of Static Condensers (STATCON), Thyristor Controlled Series Capacitors (TCSC) and Static Var Controllers (SVC) were examined in this previous study.
To meet the forecasted future electrical load in California, either additional generation must be installed or import capability must be increased. FACTS technologies help improve power transfer, power quality and system control. FACTS technologies use high-speed, thyristor-controlled devices and advanced control concepts to allow loading lines to their thermal limits without compromising system reliability. This study conducted detailed technical and economic studies to investigate the benefits of FACTS technologies for the SDG&E service territory.

This project supports the PIER Program objectives of:
- Improving the reliability/quality of California's electricity by allowing operators to load lines to their thermal limits without compromising system reliability.
- Improving the energy cost/value of California's electricity by improving the efficiency of the power transfer capacity of the electricity transmission system.
- Improving the environmental and public health costs/risks of California's electricity by improving the power carrying capability of the existing system thereby reducing the need for new transmission lines.

Proposed Outcome:
1. Conduct detailed technical and economical studies to investigate the benefits of Flexible AC Transmission Systems (FACTS) devices located in SDG&E's service territory. The study focus was on the potential benefits of existing and new FACTS devices in improving SDG&E's import capability.

Actual Outcomes:
1. Preliminary studies show that facility overload and reactive power deficiency are the main problems associated with increasing SDG&E's import capability.
2. FACTS technology can be used to mitigate both problems and could possibly increase SDG&E's simultaneous import capability by 300 MW by relieving line overloads and providing dynamic reactive power support.
3. FACTS also could possibly increase non-simultaneous import capability by 250 MW by relieving line overloads and providing dynamic reactive power support.
4. The system transfer capability increases can also be achieved through rearrangement of transmission circuits at lower cost than the FACTS technology.

Project Status:
The project has been completed. For the final report, please right click on
www.energy.ca.gov/pier/final_project_reports/600-00-037.html